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erly motion continues until January 19, 1903, by which time the comet's position will be 11^h 18^m Right Ascension and —46° 27′ Declination. It then turns to the northwest, and by March 3, 1903, the last date of the ephemeris, it has reached 6^h 35^m Right Ascension and —11° Declination. At this time its theoretical brightness is still 0.6 that at discovery, and therefore it should be easy to observe until the end of March at least.

In view of its close approach to *Mercury*, and of the long duration of visibility of the comet, it seemed desirable to have a set of elements that would represent its motion with more accuracy than could be expected of the preliminary elements.

I therefore computed a set of parabolic elements based on the discovery position and my own observations made on October 2d and November 1st.

The elements had been derived and an ephemeris planned when the *Astronomische Nachrichten* containing STRÖMGREN'S ephemeris reached me. For comparison I give the two sets of elements here:—

	STRÖMGREN.		AITKEN.	
T =	1902, Nov. 23.88925 M. T. Berlin.		Nov. 23.85514 Greenwich M. T.	
ω =	152° 57′ 28″.2	1902.0	152° 57′ 50″.3	1902.0
Ω =	49 21 7 .5		49 21 17 .3	
i =	156 21 9 .8		156 21 5 .1	
log q =	9.603246		9.603212	

Reduced to Greenwich mean time, STRÖMGREN'S T becomes Nov. 23.85204 Evidently the two sets of elements are so nearly identical that it would be waste of time to compute an ephemeris from mine.

It is hoped that in the next number of these *Publications* we may be able to reproduce some of the fine photographs of the comet that have been secured here by Mr. R. H. CURTISS.

November 12, 1902. R. G. AITKEN.

OBSERVATIONS OF δ *EQUULEI.*

On account of the shortness of its periodic time and by reason of its forming a determinate connecting link between the visual and spectroscopic binaries, δ *Equulei* may be regarded as the most interesting of all the double stars. The early determinations of its orbit gave about 11.45 years as the time of revolution, but the observations made within the past three years show that this value is erroneous, and they further make it evident that the true period is not far from 5.7 years. This is shorter by nearly half than that of any other visual double star.

The spectrum of δ *Equulei* is not constantly the same. There are relative shiftings of the lines which make them appear broader at some epochs than at others. This is due to the relative motions of the two stars. The variations in the spectrum, so far as they have been observed, are perfectly in accord with the short period of 5.7 years, but they do not agree at all with the longer one.

The first orbits obtained for this binary, those having periods of about 11.45 years, are nearly circular. In deriving them the computers assumed that the companion receded to about equal apparent distances from the principal star on either side of it, and that the motion was in a plane having, as is true, a very high inclination. The apparent ellipse which they obtained was very elongated, and the principal star was near its center. This corresponds to a nearly circular orbit, and to changes in the apparent distance which should take place very nearly in the manner of simple harmonic motion. The observations secured since the summer of 1899 show conclusively that the apparent distance does not change in this manner. Between October, 1899, and July, 1900, the distance decreased far more rapidly than was expected. On the first of these dates it was about one third of a second; on the last Professor AITKEN found it too small for exact measurement with the great refractor. It was then much less than a tenth of a second.

During the summer of 1901 the distance increased to about 0″.15 and then decreased again. By the middle of December it had become so small that the star appeared nearly or quite round even under the most favorable conditions. These variations of distance, with a maximum of about 0″.15 on one side of the principal star and of about 0″.40 on the other, are fatal to the old hypothesis that the period of this pair is about 11.45 years, and they are entirely in accord with the theory that the period is about 5.7 years.

My measures of this pair to the middle of August, 1901, are given in Volume V of the *Publications of the Lick Observatory*. Those secured subsequently are given below. Professor AITKEN has also measured this star on some of the same nights, and when this was done we have taken the precautions mentioned in his accompanying article to render our results wholly independent. All the measures have been made with the 36-inch refractor. The powers used are indicated in the last column. The eye-piece giving a power of 2400 is the very excellent one that we constantly use on the 12-inch telescope, where it has a power of somewhat more than 600. A new adapter was made to enable us to use it in measuring this star with the large telescope last year, when the distance was becoming so small.

MEASURES.

1901.715	206°.1	0″.09	1900
.742	205 .7	0 .08	1500
.756	208 .0	0 .07	1900
.778	206 .0	<0 .10	1500
.781	206 .0	0 .07	2400
.793	198 .2	0 .05	2400
.833	194 .1	0 .05 est.	2400
.853	194 .7	0 .05 est.	2400
.890	With power 1000 the image is apparently round. With power 2400 there appears to be a very slight elongation in the direction 200°, but the distance appears to be not so great as 0″.05. Seeing good.		
.968	With power 2400 elongation uncertain. Distance regarded under 0″.05, and certainly too small to be measureable. Turned at once to *κ Pegasi*. Its distance was less than 0.10, yet its elongation was easily seen.		
1902.389	25°.8	<0″.10	2400
.463	38 .1	0 .07 est.	2400
.545	46 .9	0 .08	2400
.597	42 .8	0 .09	1500
.638	36 .2	0 .12	2400
.695	43 .1	0 .12	1500
.723	41 .1	0 .13	2400
.753	35 .9	0 .16	2400
.788	39 .1	0 .16	2400
.827	38 .2	0 .15	1500

MT. HAMILTON, Nov. 14, 1902. W. J. HUSSEY.